

WHAT IS CLAIMED IS:

1. 1. A lightweight, laminated structural component made of thin
2 metal plies comprising at least one sheet metal component
3 that is uninterrupted throughout its area and at least one
4 further sheet metal component constructed as a framework
5 forming a lattice, and a first adhesive bond between said
6 at least one sheet metal component and said lattice.
- 1 2. The lightweight, laminated structural component of claim 1,
2 wherein said at least one sheet metal component comprises
3 a first sheet metal ply that is uninterrupted throughout
4 its area, a second sheet metal ply that is also
5 uninterrupted throughout its area, a second adhesive bond
6 between said first and second uninterrupted metal plies to
7 form a first ply structure, and wherein said further sheet
8 metal component comprises a first sheet metal lattice, a
9 second sheet metal lattice and a third adhesive bond
10 between said first and second sheet metal lattices, to form
11 a second ply structure, and wherein said second ply
12 structure is bonded to said first ply structure by said
13 first adhesive bond.
- 1 3. The lightweight, laminated structural component of claim 1,
2 further comprising stiffening members (18, 19) operatively
3 secured at least partly to said lattice for forming a skin
4 of an aircraft fuselage, said stiffening members extending

5 radially inwardly relative to a longitudinal central axis
6 of said aircraft fuselage.

- 1 4. The lightweight, laminated structural component of claim 3,
2 wherein said stiffening members comprise stringers (18)
3 extending in parallel to said longitudinal central axis,
4 and ribs (19) extending circumferentially relative to said
5 longitudinal central axis.
- 1 5. The lightweight, laminated structural component of claim 3,
2 wherein said lattice comprises struts (10, 11, 12) forming
3 an integral part of said lattice and positioned for
4 strengthening said lattice in accordance with load
5 dependent criteria.
- 1 6. The lightweight, laminated structural component of claim 5,
2 wherein said struts (11, 12) extend in parallel to said
3 stiffening members (18, 19) and/or at an angle relative to
4 said stiffening members.
- 1 7. The lightweight, laminated structural component of claim 1,
2 wherein said lattice comprises sheet metal strip shaped
3 lands positioned for facing into an aircraft fuselage, said
4 strip shaped lands forming at least one sheet metal ply
5 with open fields surrounded by said strip shaped lands.
- 1 8. The lightweight, laminated structural component of claim 1,
2 wherein said at least one sheet metal component and said

3 further sheet metal component forming said lattice have a
4 thickness within the range of 0.5 mm to 5.0 mm.

1 9. The lightweight, laminated structural component of claim 1,
2 wherein said at least one sheet metal component and said at
3 least one further sheet metal component are made of a metal
4 selected from the group of: alloys of aluminum, alloys of
5 titanium, steel alloys, alloys of copper, alloys of zinc,
6 and alloys of magnesium.

1 10. A method for manufacturing a lightweight, laminated
2 structural component comprising the following steps:

- 3 (a) preparing a sheet metal component forming at least one
4 sheet metal ply that is uninterrupted throughout its
5 area,
- 6 (b) preparing a sheet metal framework as a lattice having
7 strip shaped lands surrounding open fields, and
- 8 (c) adhesively bonding said lattice to said at least one
9 sheet metal ply.

1 11. The method of claim 10, wherein said adhesive bonding is
2 performed so that at least portions of said lattice are
3 adhesively bonded to said at least one sheet metal ply and
4 wherein said portions are determined by load distribution
5 patterns to which said structural component is exposed.

1 **12.** The method of claim 10, wherein said preparing steps and
2 said adhesive bonding step are performed as a continuous,
3 uninterrupted production operation.

1 **13.** The method of claim 10, comprising using an epoxy film as
2 a bonding layer between said lattice and said sheet metal
3 component.

1 **14.** The method of claim 10, further comprising preparing at
2 least two uninterrupted sheet metal plies, adhesively
3 bonding said at least two uninterrupted sheet metal plies
4 to each other, preparing at least one lattice, and
5 adhesively bonding said at least one lattice to said at
6 least two uninterrupted sheet metal plies.

1 **15.** The method of claim 10, further comprising securing
2 stiffening members (18, 19) to said strip shaped lands by
3 any one or more of the following steps: adhesive bonding,
4 riveting and welding.